

a function for responding to a variety of user's requests is connected.

The wireless base station 11 includes a millimeter/sub-millimeter wave transmitter unit 25 for transmitting a sub-millimeter wave or millimeter wave through the down-link channel, a transmitter/receiver 5 unit 26 for receiving a 2.4-GHz ISM band (or receiver unit 26 for receiving a 2.4-GHz frequency band), and a wireless media access control (MCA) unit 27.

In the wireless base station 11, the sub-millimeter/millimeter wave transmitter unit 25 includes an antenna, a power amplifier, and an up-link converter. The 2.4-GHz transmitter/receiver unit 26 includes an antenna, 10 a LNA, a down-link converter, a power amplifier and a down-link converter (The receiver unit 26 includes an antenna, a LNA and a down-link converter). The MAC unit 27 includes a baseband modem between the same and the communication network 13, and has a two-band wireless system conversion function for the data between the communication network 13 and the transmitter/receivers etc., and a function for preventing a data collision on the bus cable between the data which a plurality of terminals transmitted.

Each of the subscriber's terminals 12₁ to 12_N includes a 2.4-GHz 20 transmitter/receiver unit or a 2.4-GHz-ISM-band transmitter unit 22 for transmitting data through the down-link channel, a receiver unit 21 for receiving data of sub-millimeter wave or a millimeter wave through the up-link channel, and a wireless MAC unit 23.

In each wireless subscriber's terminal 12, the 2.4-GHz-ISM-band 25 transmitter/receiver unit 22 includes an antenna, a LNA, a down-link

converter, a power amplifier, an up-link converter etc., whereas the 2.4-GHz transmitter unit 22 includes an antenna, a LNA, a down-link converter etc. The wireless MAC unit 23 includes a baseband modem between the same and the user's terminal 24, and has a two-band wireless system conversion function for converting data between the Ethernet and the transmitter/receiver unit etc.

Operation of the wireless access system of Fig. 1 will be described with reference to an example wherein a user's terminal 24 accesses the user server 28 on the internet.

First, the user's terminal 24 transmits a request packet to the Ethernet for requesting the user server 28 of transmission of desired data.

The request packet is fed to the wireless subscriber's terminal 12 through the user's having different frequency allocation.

The request packet fed to the wireless subscriber's terminal 12 is converted by the wireless MAC unit 23 into the frame format of the 2.4-GHz wireless link, subjected to modulation and frequency conversion, and then transmitted through the 2.4-GHz transmitter unit 22.

The request packet transmitted from the 2.4-GHz transmitter unit 22 is received by the 2.4-GHz receiver unit 26 in the wireless base station 11, subjected to frequency conversion and demodulation to be restored to the original request packet in the wireless MAC unit 27.

If the 2.4-GHz wireless link constitutes a system that requires acknowledge (ACK) signal, the ACK signal is returned to the wireless subscriber's terminal 12 through the 2.4-GHz wireless link.

The request packet restored in the wireless base station 11 is fed

through the communication network or backbone network 13 connected to the wireless base station 11 to the ISP server and then the router of the ISP14, and transmitted to the Internet 15.

The user server 28 targeted on the Internet 15 receives the request 5 packet from the Internet 15, and returns a response packet group.

The response packet group transmitted from the user server 28 arrives at the wireless base station 11 through the Internet 15, the ISP14, and the backbone network 16.

The response packet group fed to the wireless base station 11 is 10 converted by the wireless MAC unit 27 into the frame format of the sub-millimeter/millimeter waveband wireless link, subjected to modulation and frequency conversion to be fed to the sub-millimeter/millimeter waveband transmitter unit 25.

The response packet group fed through the sub-millimeter/millimeter waveband transmitter unit 25 is received by the sub-millimeter/millimeter waveband receiver 21 of the wireless subscriber's terminal 12, subjected to frequency conversion and demodulation to be restored to the original response packet group in the wireless MAC unit 23.

The response packet group thus restored to the original packet 20 group is fed to the user's terminal 24 through the user's Ethernet.

The request packet transmitted from the user's terminal 24 through the up-link channel has a smaller data size, whereas the response packet group transmitted from the user server 28 through the down-link channel has a larger data size. In the above embodiment, by using a 2.4-GHz ISM 25 band through the up-link channel while a sub-millimeter or millimeter